Public Works Canada
Solar Programs Office

Federal Commercial/Industrial
Solar Heating Program
Annex 2
CONCEPT DESIGN REPORT

September 1983

Completed by:

Name: _____

Date: _____

Firm: _____

Tel. #: ( ) _____

PROFESSIONAL ENGINEER'S SEAL AND SIGNATURE:

SR73/A

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INTRODUCTION

INSTRUCTIONS TO PROPOSERS

This report is to be used by solar designers for the preparation and submission of Concept Designs for solar heating systems under the federal government's "Commercial/Industrial Solar Heating" program. Funds for design and construction of the system are approved on the basis of information contained in the completed report.

When submitted for approval, the completed report must be signed and certified (on the cover) by a professional engineer licensed in Canada. All working plans and specifications must also be signed and certified by a Canadian P.Eng.

CONCEPT DESIGN CHECKLIST

The Concept Design comprises the following:

- Completed Concept Design Report
- Photo of building/facility for which solar system is proposed
- Calculations for energy requirements
- Description of energy conservation measures to be implemented
- Schematic diagram (sketch) of solar system
- Description of solar system operation
- Draft System Operations Manual
- Calculations, methods and assumptions used in sizing the solar system
- Sketch or drawing to show location of system components
- Description of any necessary building modifications

SECTION I: CONCEPT DESIGN SUMMARY

Name of Building or Facility: _____

Proposer (firm) : _____

(contact): _____ Telephone #: ( )_____

Design Firm: _____

Contact: _____ Telephone #: ( )_____

Total Estimated Cost of System (from VII): $_____

BUILDING/FACILITY

New _____ Scheduled Retrofit _____ Non-scheduled Retrofit _____

Type: _____ (from 7.1)

Inside gross area: _____ m^2 (from 6.1)

Urban location: _____ Province: _____

ENVIRONMENT

Insolation: _____ $MJ/m^2/day$ (from 9.2)

Degree Days: _____ °C Days (from 9.3)

SOLAR SYSTEM

Application Type: _____ (from 12)

System Type: _____ (from 16.1)

Collector - type: _____ Slope: _____°

- gross area: _____ m^2 (from 19.2) Azimuth: _____°

Based on approved model: _____ (from 19.3)

Storage - type: _____

- volume: _____ m^3 (from 19.4)

Auxiliary fuel: _____ (from 13.2 or 20)

Annual solar energy delivered (from 19.1): _____ GJ

SYSTEM PERFORMANCE INDICATORS

Solar Energy Cost: _____ $/a.GJ (from 21)

Solar System Cost: _____ $/m^2$ (from 22)

Solar Energy Contribution: _____ $GJ/m^2.a$ (from 23)

Solar Fraction: _____ % (from 24)

SECTION II: CORPORATE INFORMATION

1. **PROPOSER**
(Firm applying for program funds)

Name : _____

Address: _____

_____ Postal Code _____

Representative: _____ Telephone #: ( ) _____

2. **BUILDING/FACILITY**
(Name of Building/Facility for which solar heating system is proposed)

_____

Address: _____

_____ Postal Code _____

3. **OWNER**
(If different from 1, above)

Name : _____

Address: _____

_____ Postal Code _____

Representative: _____ Telephone #: ( ) _____

4. **ENGINEERING RESPONSIBILITY**
(Engineer responsible for design of proposed solar heating system)

Name : _____ Telephone #: ( ) _____

Organization: _____

Address: _____

_____ Postal Code _____

SECTION III: BUILDING/FACILITY INFORMATION

5. STATUS
(Complete a OR b)

a) Existing building or facility:
Age (years): _____
Remaining useful life (years): _____

b) New building or facility (i.e. in planning stage):
Completion date: _____
Expected useful life (years): _____
Current stage of approval: _____

Critical project dates: DESIGN START: _____ FINISH: _____

CONSTRUCTION START: _____ FINISH: _____

6. SIZE

6.1 Gross floor area: _____ m^2

6.2 Number of storeys above ground: _____

7. USE

7.1 Type of Building or Facility (check one):

_____ Residential (multi-unit only)

_____ Commercial

_____ Agricultural

_____ Institutional

_____ Industrial

_____ Recreational

7.2 Use/Occupancy:

_____ hrs/day _____ hrs/night _____ days/week

_____ weeks/year _____ hrs/year

7.3 Describe Use: _____

_____

_____

7.4 Regular public access, (e.g. shopping mall)

Yes/No: _____

7.5 Public Relations/Education Potential:

- Facility visible from heavy traffic area? Yes/No: _____
- Public tour potential? Yes/No: _____

8. OPERATION AND MAINTENANCE

Give the authority responsible for routine Operation and Maintenance:

_____

_____ Telephone #: ( ) _____

9. ENVIRONMENTAL DATA

9.1 Latitude _____ °N Elevation _____ m

9.2 Average Annual Daily Insolation (MJ/m^2-day): _____ (See Appendix II)

9.3 Annual Average Degree Days (°C day): _____ (See Appendix II)

10. SITE SUITABILITY

10.1 Site Location (check one):

_____ Downtown

_____ Urban/Residential

_____ Industrial

_____ Rural

10.2 Overall site descriptions - details of surrounding buildings, trees, etc.

_____

_____

_____

_____

10.3 Attach photo(s) of building/facility.

SECTION IV: STRUCTURAL CONSIDERATIONS

Solar collectors may be mounted on the ground, on the roof, or on an unshaded south facing wall (a penthouse wall is preferred, for reasons of access). Ground mounted collectors should not present any structural problems. Problems may arise, however, if collectors are to be mounted on a building that was not originally designed to take the collector load and additional wind load, snow load and thermal load.

Evaluations of existing buildings indicated that they are frequently capable of carrying loads for which they were not originally designed. There are several reasons for this:

(a) the designer was over conservative
(b) the design was done in accordance with an older, more conservative building code
(c) the fabricator may have substituted heavier sections than those called for in the drawings
(d) the loads due to collectors are small in comparison with other design loads.

At the Concept Design stage it will not be possible to say for certain whether a building can safely support the solar collector installation. However, it is possible to assess whether it is likely that the structure will prove adequate or whether expensive modifications will be required.

11. STRUCTURAL FEASIBILITY

Lists of favourable and unfavourable structural factors are provided. A building displaying only unfavourable factors should not be submitted. Judgment must be used when assessing the balance of favourable and unfavourable factors to decide on structural feasibility.

11.1 Does the structure consist of or include any of the following unfavourable factors: (Check)

_____ Light, prefabricated structure

_____ Timber frame

_____ Long span joints or trusses on masonry block walls

_____ A history of structural problems associated with structural design: sagging roof beams, poor roof drainage, spalled concrete, deteriorated parapets

_____ A location exposed to high wind such as open level terrain, with few surrounding buildings or trees

11.2 Does the structure consist of or include any of the following favourable factors: (Check)

_____ Concrete structure designed for large dead load

_____ Interior support columns (so that collectors can be mounted off the columns)

_____ Inverted roof system

_____ South facing penthouse wall

_____ Structural steel building with closely spaced joists and 'X' bridging

11.3 According to which system was the building designed (leave blank if information is not available):

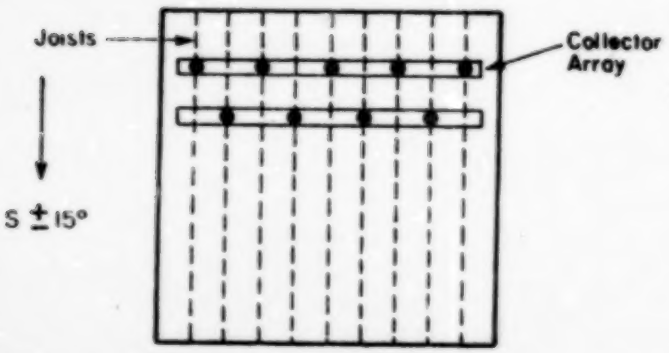
_____ Working Stress Design (preferred)

_____ Ultimate Strength Design

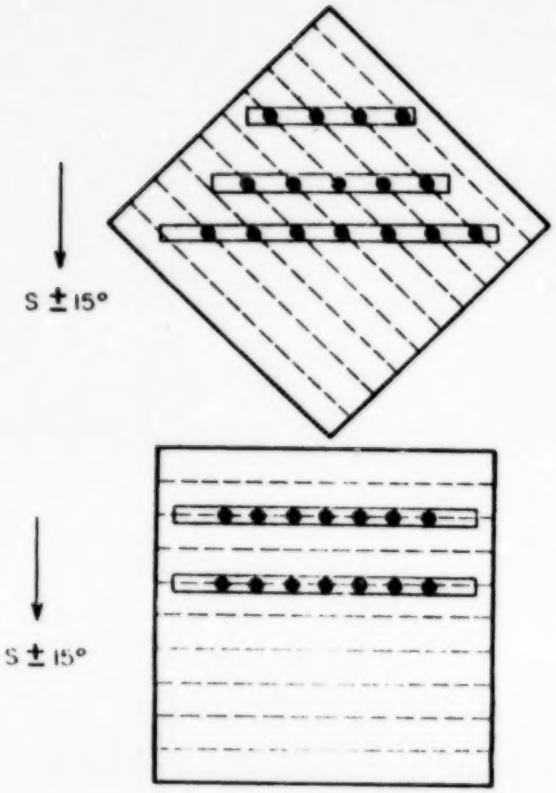
_____ Limited States Design

11.4 Direction of roof joists, flat roof mounting

If flat roof mounting is considered, which of the three following diagrams is most appropriate to the direction of roof joists in relation to the proposed direction of solar collector arrays: a _____ b_____ c_____



a) roof joists 90°to direction of collector arrays. (Preferred for distribution of load and snow load)



b) roof joists 20-45° to direction of collector arrays. (Unfavourable for reasons of complexity and cost but preferable to c))

c) roof joists are in same direction (within 15°) as collector arrays. (Unfavourable distribution of load along a few joists)

SECTION V: ENERGY REQUIREMENTS

12. LOAD SELECTION/APPLICATION TYPE

Check the heating load(s) to which the proposed solar heating system will contribute:

_____ DHW Heating

_____ DHW and Space Heating

_____ DHW and Process Water Heating

_____ DHW, Process Water and Space Heating

_____ Process Water Heating

_____ Process Water and Space Heating

_____ Space Heating

_____ Swimming Pool Heating

_____ Swimming Pool and DHW Heating

_____ Swimming Pool and Space Heating

_____ Swimming Pool, DHW and Space Heating

_____ Process Air Heating

_____ Other (specify): _____

13. EXISTING HEATING SYSTEM

13.1 Existing Heating System Type (check):

_____ Forced Air, capacity _____ L/sec

_____ Electric Baseboard Heaters, total capacity _____ kW

_____ Radiant Heaters

_____ Hot Water System, Storage tank capacity _____ L

_____ Other (specify type and capacity): _____

13.2 Existing Heating System Fuel (check):

_____ Electricity

_____ Natural Gas

_____ LPG or Propane

_____ Diesel Fuel

_____ Fuel Oil No. 2

_____ Fuel Oil No. 5

_____ Fuel Oil No. 6

_____ Coal

_____ Wood

_____ Purchased Steam

_____ Other (specify): _____

14. MINIMIZING ENERGY REQUIREMENTS THROUGH CONSERVATION

Append a description of any energy conservation measures that are already planned for implementation on the building/facility.

15. CALCULATIONS FOR DETAILED ENERGY REQUIREMENTS

15.1 An accurate assessment of energy requirements is one of the most critical elements of solar system design. The size and consequently the capital cost, of the proposed solar heating system will be a direct function of the energy output required. Oversized solar heating systems would have poor system performance indicators resulting in high $/a.GJ figures.

15.2 Consideration is to be given only to those energy requirements of a building or facility for which the use of nonrenewable energy is to be replaced or supplemented by means of a solar system. In addition to estimating the annual energy requirements, it is important to recognize load profiles. These profiles should be related to availability of insolation when the system is designed.

15.3 Energy consumption records, when available, are preferable to estimates. Estimates should be based on average requirements, rather than peak load conditions. Unlike conventional heating systems, the solar energy system will not be sized to meet peak load conditions but to supply only a portion of longer term energy requirements.

15.4 Complete Worksheet No. 1, "Energy Requirements", based on:

either: fuel consumption records (see Appendix I: Heating values of fuels, for conversion to GJ).

or: fuel consumption estimates, indicating sources of data. (A frequently used reference is the ASHRAE 1980 Systems Handbook, Chapter 37, Table 6.)

Energy requirements should take into consideration the conservation methods outlined in response to Item 14, above.

Worksheet No. 1: Energy Requirements

Based on (check): fuel consumption records _____
: energy estimates _____

Line	(1)	(2)	3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Description	Month	Monthly degree-days	Monthly space heating load	Volume of hot water used per day	Hot Water supply temp	Water main temp	Water temp rise	Hot Water heating load per day	Days/Mo.	Hot Water heating load per month	Other heat requirement	Total heating requirement
Source		Appendix					(5) - (6)			(8)x(9) x 10-3		(11)+(10) +(3)
Units		°C-day	GJ/mo	litres/day	°C	°C	°C	MJ/day		GJ/mo	GJ/mo	GJ/mo
	Jan											
	Feb											
	Mar											
	Apr											
	May											
	Jun											
	Jul											
	Aug											
	Sep											
	Oct											
	Nov											
	Dec											
	Annual Total											

Note: Provide all fuel records, calculations and assumptions on separate sheets.

SECTION VI: SOLAR SYSTEM DESCRIPTION AND SIZING CALCULATIONS

16. SOLAR SYSTEM TYPE

16.1 System Selection

Check one:

Liquid Systems:

_____ Closed Loop

_____ Drain Back

_____ Other (specify): _____

Air Systems:

_____ Fresh Air Preheating

_____ Recirculation Heating (no storage)

_____ Other (specify): _____

16.2 Provide reasons for the selection of the proposed system type:

_____

_____

_____

_____

_____

17. SOLAR SYSTEM DESCRIPTION

17.1 Provide a schematic sketch or drawing of the solar system, showing each component, connecting piping and/or ducting and controls, including provisions for performance and energy monitoring equipment.

17.2 Provide a description of the operation of the solar heating system, including system controls and integration with auxiliary heating system.

17.3 Provide an outline for a draft System Operations Manual to describe operational procedures.

18. SOLAR SYSTEM SIZING CALCULATIONS

18.1 Calculations must be based on approved collectors.

18.2 Provide computer input and output sheets for WATSUN or other appropriate design program used.

19. SOLAR SYSTEM SIZING SUMMARY

19.1 Solar energy supplied by solar system: _____ GJ/a

19.2 Gross collector area required: _____ m^2

19.3 Based on approved collector model: _____

19.4 Storage volume required: _____ m^3

19.5 Storage heat loss coefficient: _____ $W/m^2.°C$

19.6 Provide a sketch or drawing to show location of major system components such as collectors and storage.

20. AUXILIARY HEATING SYSTEM

If the auxiliary heating system differs from the existing heating system described in Item 13, provide details:

_____

_____

_____

_____

20.1 Estimated annual operating and maintenance costs for the solar heating system: _____ $/a

SECTION VII: PROJECT COST ESTIMATION SHEET

Name of Building/Facility: _____

Proposer (firm applying for funds): _____

Prepared by (PRINT NAME): _____

Telephone #: _____ Date: _____

Gross collector area of proposed system: _____ m^2 Heat storage volume: _____ m^3

A) CONSTRUCTION COSTS	Estimate $	SPO Use Only %
01 COLLECTOR ARRAY (No. of collectors: _____) (includes $_____ ex-factory cost per collector)		Do not use this column
02 COLLECTOR SUPPORT STRUCTURE	.. ..	.. ..
03 PIPING	.. ..	.. ..
04 DUCTWORK	.. ..	.. ..
05 INSULATION	.. ..	.. ..
06 EQUIPMENT	.. ..	.. ..
07 AUXILIARY HEATING	.. ..	.. ..
08 HEAT STORAGE	.. ..	.. ..
09 CONTROLS	.. ..	.. ..
10 ELECTRICAL	.. ..	.. ..
11 BUILDING MODIFICATIONS*	.. ..	.. ..
12 COMMISSIONING AND TESTING**	.. ..	.. ..
13 GENERAL CONDITIONS OVERHEAD AND PROFIT/FEE	.. ..	.. ..
CONSTRUCTION TOTAL:		

B) ENGINEERING AND PROFESSIONAL FEES	
01 PRELIMINARY DESIGN	.. ..
02 FINAL DESIGN	.. ..
03 INSPECTION	.. ..
04 COMMISSIONING AND TESTING*	.. ..
ENGINEERING AND PROFESSIONAL FEES TOTAL:	

A + B TOTAL:	

* Provide details.

** Commissioning and Testing costs should be included in only one of A) or B).

SECTION VIII: SYSTEM PERFORMANCE INDICATORS

21. SOLAR ENERGY COST ($/a.GJ)

$$\text{Solar Energy Cost} = \frac{\text{Capital Cost, \$}}{\text{GJ/a (Annual Solar Energy Supplied)}}$$

$$= _____ \text{ \$/a.GJ}$$

22. SOLAR SYSTEM COST ($/m^2)

Note: Capital Cost is total, A + B, from Cost Estimation Sheet (see 14).

$$\text{Solar System Cost} = \frac{\text{Capital Cost, \$}}{\text{Gross Collector Area, m}^2}$$

$$= _____ \text{ \$/m}^2$$

23. SOLAR ENERGY CONTRIBUTION (GJ/m^2-a)

$$\text{Solar Energy Constribution} = \frac{\text{Annual Solar Energy Supplied, GJ/a}}{\text{Gross Collector Area, m}^2}$$

$$= _____ \text{ GJ/m}^2\text{-a}$$

24. SOLAR FRACTION (%)

$$\text{Solar Fraction} = \frac{\text{(Annual Solar Energy Supplied, GJ/a)} \times 100}{\text{(Total Annual Energy Required, GJ/a)}}$$

$$= _____ \text{ \%}$$

25. FIRST YEAR FUEL SAVINGS (GJ/a)

$$\text{First year fuel savings} = \frac{\text{Annual Solar Energy Supplied, GJ/a}}{\text{Auxiliary Heating System Efficiency (\%)}}$$

$$= _____ \text{ GJ/a}$$

26. FIRST YEAR FUEL COST SAVINGS ($/a)

First year fuel cost savings

(fuel savings, GJ/a) x (fuel price, $/GJ)

= (_____ GJ/a) x (_____ $/GJ)

= _____ $/a

27. SOLAR SYSTEM EFFICIENCY (%)

Solar System Efficiency = $\frac{\text{Annual Solar Energy Supplied, GJ/a}}{\text{Annual Incident Solar Energy on Collectors, GJ/a}}$

= _____ %

APPENDIX I: HEATING VALUES OF FUELS

Fuel Type	Unit	Conversion to GJ
Electricity	kWh	x 0.0036 = GJ
Heating Oil	L	x 0.0395 = GJ
Natural Gas	m3	x 0.0373 = GJ
LPG or Propane	L	x 0.0271 = GJ
Coal	t	x 28.0000 = GJ
Purchased Steam	kg	x 0.0027 = GJ
Diesel Fuel	L	x 0.0386 = GJ

CONVERSION FACTORS:

HEATING VALUES OF FUELS

APPENDIX II: CANADIAN CITY DATA

			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1 ABBOTSFORD	BC	D-D (BASED ON 18 C)	519	390	384	283	183	99	52	52	110	245	370	463
(LATITUDE=49 03)		MEAN AMB TEMP (C)	1 3	4 2	5 6	8 6	12 2	14 9	16 9	16 7	14 4	10 1	5 7	3 1
		SOLAR (KJ/M**2/DAY)	3139	6279	10884	16325	20721	22604	23442	19465	14232	7325	4019	1758
2 AKLAVIK	NWT	D-D (BASED ON 18 C)	1445	1276	1245	927	574	255	140	225	432	787	1126	1405
(LATITUDE=68 23)		MEAN AMB TEMP (C)	-29 0	-27 0	-22 0	-13 0	0 0	10 0	14 0	11 0	4 0	-7 0	-19 0	-27 0
		SOLAR (KJ/M**2/DAY)	167	1926	7535	15697	20302	22060	18544	12265	6446	2344	419	251
3 ARMSTRONG	ONT	D-D (BASED ON 18 C)	758	580	502	302	165	68	22	36	147	343	513	659
(LATITUDE=50 28)		MEAN AMB TEMP (C)	-6 4	-2 5	1 8	7 9	12 7	16 4	19 2	17 9	13 2	6 9	8	-3 2
		SOLAR (KJ/M**2/DAY)	5107	8791	14149	18167	19674	22186	22186	18000	11846	7116	4730	3474
4 BAGOTVILLE	QUE	D-D (BASED ON 18 C)	1046	893	762	485	283	100	45	74	198	382	587	921
(LATITUDE=48 33)		MEAN AMB TEMP (C)	-15 7	-13 6	-6 7	1 9	9 1	15 2	17 8	16 5	11 6	5 8	-1 6	-11 5
		SOLAR (KJ/M**2/DAY)	5232	8581	14651	16953	18837	20930	19883	16744	12223	7535	4312	3651
5 BAIE COMEAU	QUE	D-D (BASED ON 18 C)	988	869	769	543	357	174	93	121	230	408	585	858
(LATITUDE=49 23)		MEAN AMB TEMP (C)	-14 1	-13 1	-6 8	3	6 7	12 6	15 8	15 1	10 2	5 2	-1 6	-10 2
		SOLAR (KJ/M**2/DAY)	4395	8246	13604	17456	18418	20177	19214	15991	11679	7325	4060	3349
6 BANFF	ALT	D-D (BASED ON 18 C)	906	693	675	470	327	207	114	145	268	427	653	834
(LATITUDE=51 18)		MEAN AMB TEMP (C)	-11 2	-6 8	-3 8	2 3	7 5	11 2	14 5	13 4	9 1	4 2	-3 8	-8 7
		SOLAR (KJ/M**2/DAY)	4102	7535	12851	17456	20511	23023	24530	20051	14525	8665	4646	3056
7 BLUE RIVER	BC	D-D (BASED ON 18 C)	878	644	599	435	262	130	69	97	219	419	600	767
(LATITUDE=52 12)		MEAN AMB TEMP (C)	-10 6	-4 3	-1 4	3 9	9 6	13 7	16 4	15 4	11 0	6 0	-2 4	-6 9
		SOLAR (KJ/M**2/DAY)	3558	7032	11721	16953	20972	23442	23023	19256	15572	7451	3642	2637
8 BRANDON	MAN	D-D (BASED ON 18 C)	1144	934	831	453	254	86	24	46	195	382	699	989
(LATITUDE=49 58)		MEAN AMB TEMP (C)	-18 6	-15 3	-8 7	2 6	9 9	15 7	18 9	17 7	11 7	5 6	-5 3	-13 8
		SOLAR (KJ/M**2/DAY)	5232	9167	14191	18125	20930	23023	23609	19758	13772	9084	4898	3893
9 CALGARY INT'L	ALT	D-D (BASED ON 18 C)	899	719	691	439	269	150	65	97	221	383	619	793
(LATITUDE=51 10)		MEAN AMB TEMP (C)	-10 9	-7 4	-4 3	3 3	9 3	13 2	16 5	15 2	10 7	5 7	-2 6	-7 6
		SOLAR (KJ/M**2/DAY)	4312	7912	13270	17456	20511	23023	24739	20051	14651	8916	4898	3265
10 CASTLEGAR	BC	D-D (BASED ON 18 C)	677	546	477	293	144	62	9	27	115	313	482	606
(LATITUDE=49 33)		MEAN AMB TEMP (C)	-3 8	-1 2	2 6	8 3	13 4	16 8	20 6	19 6	14 5	7 9	1 9	-1 6
		SOLAR (KJ/M**2/DAY)	4186	7200	12391	17163	21349	23274	25158	20930	14860	8791	4646	3056
11 CHARLO	NB	D-D (BASED ON 18 C)	899	795	695	471	285	107	31	54	172	351	530	791
(LATITUDE=48 00)		MEAN AMB TEMP (C)	-11 7	-11 1	-5 9	7	7 4	13 1	17 2	15 7	11 0	5 4	- 7	-8 3
		SOLAR (KJ/M**2/DAY)	4605	8330	13060	16200	18628	20302	19632	16577	12558	7870	4228	3642
12 CHARLOTTETOWN	PEI	D-D (BASED ON 18 C)	767	714	657	470	292	126	27	37	130	290	441	672
(LATITUDE=46 28)		MEAN AMB TEMP (C)	-6 7	-7 2	-3 2	2 3	8 6	14 1	18 4	17 9	13 9	8 6	3 3	-3 6
		SOLAR (KJ/M**2/DAY)	5517	8870	12907	15959	18224	20657	20453	17712	12633	8040	4974	3782
13 CHATHAM	NB	D-D (BASED ON 18 C)	848	755	663	451	266	101	24	43	148	325	502	758
(LATITUDE=47 03)		MEAN AMB TEMP (C)	-3 9	-3 4	1 2	7 9	13 9	19 9	22 3	21 2	17 4	11 8	4 8	-1 8
		SOLAR (KJ/M**2/DAY)	4646	8288	12558	15697	18628	20470	19883	17163	13730	8288	4521	3893

			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
14 CHIBOUGAMAU	QUE	D-D (BASED ON 18 C)	1166	1016	875	582	371	162	89	123	242	440	670	1032
(LATITUDE=49.90)		MEAN AMB TEMP. (C)	-19.7	-17.8	-10.2	-1.4	6.1	12.9	15.8	14.5	9.9	3.7	-4.3	-15.2
		SOLAR (KJ/M**2/DAY)	4814	8539	14567	17121	18670	20846	18837	13898	11511	6698	3935	3307
15 CHURCHILL	MAN	D-D (BASED ON 18 C)	1414	1262	1187	871	630	359	194	204	366	590	902	1234
(LATITUDE=58.78)		MEAN AMB TEMP. (C)	-27.6	-26.7	-20.3	-11.0	-2.3	6.1	12.0	11.5	5.7	-1.0	-11.9	-21.8
		SOLAR (KJ/M**2/DAY)	2278	5774	12277	19055	20573	22084	20779	15832	9022	4280	2364	1541
16 COMOX	BC	D-D (BASED ON 18 C)	494	398	404	303	185	93	43	51	129	276	380	448
(LATITUDE=49.72)		MEAN AMB TEMP. (C)	2.1	3.9	4.9	7.9	12.1	15.2	17.3	16.8	13.7	9.1	5.4	3.6
		SOLAR (KJ/M**2/DAY)	3056	5944	10381	15823	20093	21976	22814	18418	13395	6572	3767	2302
17 CORONATION	ALT	D-D (BASED ON 18 C)	1061	854	779	463	246	124	49	80	221	410	696	922
(LATITUDE=52.10)		MEAN AMB TEMP. (C)	-16.2	-12.2	-7.1	2.6	10.1	14.2	17.4	16.1	10.7	4.8	-5.2	-11.7
		SOLAR (KJ/M**2/DAY)	4186	7912	13604	18209	20846	23442	23860	19172	13814	8581	4605	3181
18 CRANBROOK	BC	D-D (BASED ON 18 C)	829	641	577	367	227	118	41	61	185	378	590	748
(LATITUDE=49.50)		MEAN AMB TEMP. (C)	-8.9	-4.7	-.6	5.9	10.7	14.3	17.8	16.8	11.9	5.8	-1.8	-6.2
		SOLAR (KJ/M**2/DAY)	4395	7744	13018	17372	21390	23358	25242	20972	14860	9125	5065	3265
19 CREE LAKE	SAS	D-D (BASED ON 18 C)	1351	1092	987	581	327	128	83	117	333	536	877	1215
(LATITUDE=57.38)		MEAN AMB TEMP. (C)	-23.7	-19.5	-12.3	-1.7	6.3	12.5	16.2	14.7	8.3	2.1	-11.1	-19.5
		SOLAR (KJ/M**2/DAY)	2637	6405	10381	19088	22604	23274	21935	17330	10423	5860	2763	1842
20 DAUPHIN	MAN	D-D (BASED ON 18 C)	1159	950	849	485	261	98	32	54	198	370	693	1001
(LATITUDE=51.15)		MEAN AMB TEMP. (C)	-18.6	-15.5	-9.2	2.3	9.8	15.4	18.6	17.4	11.6	6.1	-5.1	-13.9
		SOLAR (KJ/M**2/DAY)	4814	8791	13939	18000	20511	22437	22939	19339	12977	8205	4395	3726
21 DAWSON	YUK	D-D (BASED ON 18 C)	1443	1152	996	593	318	127	81	166	347	659	1039	1353
(LATITUDE=64.07)		MEAN AMB TEMP. (C)	-28.6	-23.0	-14.1	-1.8	7.8	13.9	15.5	12.7	6.4	-3.2	-16.5	-25.3
		SOLAR (KJ/M**2/DAY)	879	2888	8791	15070	19256	21139	18921	13604	7367	3349	1214	335
22 EARLTON	ONT	D-D (BASED ON 18 C)	1058	898	792	483	274	106	52	84	204	375	607	934
(LATITUDE=47.70)		MEAN AMB TEMP. (C)	-16.1	-13.8	-7.5	1.9	9.3	15.2	17.7	16.2	11.4	5.9	-2.2	-11.9
		SOLAR (KJ/M**2/DAY)	5358	8974	14651	17163	19674	22437	21349	17665	12349	7744	4060	3600
23 EDMONTON	ALT	D-D (BASED ON 18 C)	1016	806	727	421	222	109	47	82	215	388	666	890
(LATITUDE=53.57)		MEAN AMB TEMP. (C)	-14.7	-10.5	-5.4	4.0	10.9	14.7	17.5	15.9	10.9	5.4	-4.2	-10.7
		SOLAR (KJ/M**2/DAY)	3735	7063	12610	17488	20937	22537	23195	18084	13066	8063	4195	2781
24 ESTEVAN	SAS	D-D (BASED ON 18 C)	1050	854	750	423	228	84	20	37	177	355	653	911
(LATITUDE=49.20)		MEAN AMB TEMP. (C)	-15.8	-12.6	-6.3	3.9	10.9	16.0	19.9	18.8	12.5	6.6	-3.7	-11.5
		SOLAR (KJ/M**2/DAY)	5442	9209	14442	18377	21349	23442	24697	20429	14651	9670	5358	4186
25 FORT MCMURRAY	ALT	D-D (BASED ON 18 C)	1237	978	850	497	279	141	69	112	271	463	795	1086
(LATITUDE=56.65)		MEAN AMB TEMP. (C)	-21.5	-16.6	-9.4	1.2	9.0	13.5	16.3	14.7	9.0	3.1	-8.4	-16.9
		SOLAR (KJ/M**2/DAY)	2679	6446	12139	18921	20888	23232	21976	17665	11093	6363	3181	2093
26 FORT NELSON	BC	D-D (BASED ON 18 C)	1276	994	843	505	259	112	58	107	275	523	910	1201
(LATITUDE=58.83)		MEAN AMB TEMP. (C)	-23.2	-17.1	-9.2	1.2	9.7	14.5	16.7	14.8	8.8	1.2	-12.3	-20.7
		SOLAR (KJ/M**2/DAY)	1666	4725	9800	16117	19171	19899	19799	15485	10574	5268	2122	1097
27 FORT SMITH	NWT	D-D (BASED ON 18 C)	1403	1145	1010	637	336	153	79	124	310	542	897	1216
(LATITUDE=60.00)		MEAN AMB TEMP. (C)	-26.9	-22.6	-14.6	-3.2	7.1	13.1	16.1	14.3	7.7	.5	-11.8	-21.4
		SOLAR (KJ/M**2/DAY)	1677	4450	10397	17179	20261	21535	20419	16153	9837	4499	1667	987

********** CANADIAN CITY DATA USED FCHART **********

			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
28 FORT ST. JOHN	BC	D-D (BASED ON 18 C)	1093	846	758	465	254	136	77	112	242	430	736	970
(LATITUDE=56.25)		MEAN AMB TEMP. (C)	-17.2	-11.9	-6.4	2.5	9.8	13.6	15.9	14.7	9.9	4.2	-6.5	-13.3
		SOLAR (KJ/M**2/DAY)	2553	5819	11511	16493	19800	22604	21349	17246	11051	6279	3139	1800
29 FREDERICTON	NB	D-D (BASED ON 18 C)	833	737	635	418	235	80	21	39	147	315	489	750
(LATITUDE=45.87)		MEAN AMB TEMP. (C)	-8.8	-8.1	-2.4	4.2	10.6	16.1	19.2	18.1	13.4	7.8	1.7	-6.2
		SOLAR (KJ/M**2/DAY)	5476	8765	12484	15483	17890	20051	19654	17389	12973	8611	4988	4067
30 FROBISHER BAY	NWT	D-D (BASED ON 18 C)	1369	1236	1254	962	660	434	312	342	467	706	912	1191
(LATITUDE=63.75)		MEAN AMB TEMP. (C)	-26.2	-25.2	-22.3	-14.0	-3.3	3.5	7.9	6.9	2.4	-4.7	-12.4	-20.3
		SOLAR (KJ/M**2/DAY)	844	3454	9218	17640	22201	19885	16037	13121	7479	3349	1059	396
31 GANDER INT'L	NFL	D-D (BASED ON 18 C)	747	687	669	516	362	202	73	84	189	362	483	665
(LATITUDE=48.95)		MEAN AMB TEMP. (C)	-6.1	-6.3	-3.6	.8	6.3	11.4	16.5	15.8	11.8	6.3	1.9	-3.4
		SOLAR (KJ/M**2/DAY)	3726	6698	10884	14232	17163	18418	18209	15697	11930	7367	3809	2553
32 GOOSE BAY	NFL	D-D (BASED ON 18 C)	1065	914	821	594	407	214	91	118	248	458	650	942
(LATITUDE=53.32)		MEAN AMB TEMP. (C)	-16.3	-14.4	-8.4	-1.8	4.9	11.1	15.8	14.5	9.8	3.2	-3.6	-12.3
		SOLAR (KJ/M**2/DAY)	3545	7008	11434	15922	18124	18742	17784	14604	10173	6032	3181	2578
33 GRANDE PRAIRIE	ALT	D-D (BASED ON 18 C)	1095	861	790	469	249	133	75	107	236	431	731	968
(LATITUDE=55.17)		MEAN AMB TEMP. (C)	-17.3	-12.4	-7.4	2.4	10.0	13.7	16.0	14.8	10.2	4.2	-6.3	-13.2
		SOLAR (KJ/M**2/DAY)	3684	6363	10465	16409	20428	26749	24679	21097	12809	6823	3391	2135
34 HALIFAX	NS	D-D (BASED ON 18 C)	719	659	608	431	267	119	28	37	141	280	423	643
(LATITUDE=44.65)		MEAN AMB TEMP. (C)	-3.2	-3.3	.1	4.8	9.7	14.4	18.3	18.6	15.6	10.7	5.7	-.6
		SOLAR (KJ/M**2/DAY)	5176	7886	12313	14728	17274	19728	19222	17957	13743	9216	5250	3764
35 INUVIK	NWT	D-D (BASED ON 18 C)	1506	1337	1320	966	584	244	147	231	458	801	1189	1391
(LATITUDE=68.30)		MEAN AMB TEMP. (C)	-29.3	-29.4	-23.8	-14.6	-.8	9.8	13.3	10.3	2.7	-7.2	-20.6	-27.1
		SOLAR (KJ/M**2/DAY)	208	1951	7463	15557	20345	21962	18764	12183	6363	2392	420	28
36 JASPER	ALT	D-D (BASED ON 18 C)	936	694	643	440	288	166	96	126	242	411	654	836
(LATITUDE=52.88)		MEAN AMB TEMP. (C)	-12.2	-6.6	-2.7	3.3	8.7	12.5	15.2	14.1	9.9	4.8	-3.8	-9.1
		SOLAR (KJ/M**2/DAY)	3349	6949	11721	17163	20930	23232	22856	18921	15279	7451	3935	2553
37 KAMLOOPS	BC	D-D (BASED ON 18 C)	742	543	458	272	128	41	11	20	106	296	495	642
(LATITUDE=50.68)		MEAN AMB TEMP. (C)	-6.0	-1.3	3.6	9.3	14.3	18.0	20.9	19.7	15.0	8.4	1.7	-2.6
		SOLAR (KJ/M**2/DAY)	3349	6405	11511	16744	20553	23232	23316	19423	13688	7493	3977	2637
38 KAPUSKASING	ONT	D-D (BASED ON 18 C)	1123	956	841	521	319	136	70	105	232	401	667	995
(LATITUDE=49.42)		MEAN AMB TEMP. (C)	-18.2	-15.8	-9.1	-.6	7.8	14.1	16.9	15.3	10.4	5.1	-4.2	-14.1
		SOLAR (KJ/M**2/DAY)	4646	7828	13228	16409	18209	21767	20344	16702	11763	6865	3642	3433
39 KENORA	ONT	D-D (BASED ON 18 C)	1109	924	776	466	259	91	27	47	196	373	678	986
(LATITUDE=49.80)		MEAN AMB TEMP. (C)	-17.7	-14.7	-7.0	2.5	9.8	15.7	19.1	17.8	11.7	6.0	-4.6	-13.8
		SOLAR (KJ/M**2/DAY)	5274	9209	14442	18000	19883	22604	22939	19172	12642	8205	5023	3767
40 KINGSTON	ONT	D-D (BASED ON 18 C)	784	699	598	367	202	49	6	17	100	243	427	685
(LATITUDE=44.25)		MEAN AMB TEMP. (C)	-7.1	-7.7	-2.1	5.3	12.1	17.2	20.6	19.8	16.3	9.8	3.8	-3.2
		SOLAR (KJ/M**2/DAY)	5442	8372	12893	15907	20302	21767	21767	19046	14651	9418	5023	4186
41 LETHBRIDGE	ALT	D-D (BASED ON 18 C)	851	666	634	383	221	106	29	48	168	323	560	729
(LATITUDE=49.70)		MEAN AMB TEMP. (C)	-9.4	-5.6	-2.4	5.3	10.9	14.9	18.8	17.6	12.7	7.6	-.7	-5.5
		SOLAR (KJ/M**2/DAY)	4772	8372	13688	17832	21516	23986	25493	21432	15404	10046	5651	3516

			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
42 LONDON	ONT	D-D (BASED ON 18 C)	746	668	582	342	183	48	12	22	98	251	446	670
(LATITUDE=42.98)		MEAN AMB TEMP. (C)	-6.0	-5.6	-.7	6.6	12.3	18.2	20.5	19.7	15.7	9.9	3.1	-3.6
		SOLAR (KJ/M**2/DAY)	5274	8372	12558	15907	20511	22814	22604	18795	14860	10256	5274	4605
43 MANIWAKI	QUE	D-D (BASED ON 18 C)	975	841	722	426	240	87	40	67	176	346	539	860
(LATITUDE=46.38)		MEAN AMB TEMP. (C)	-13.4	-11.8	-5.3	3.8	10.4	15.8	18.1	16.8	12.4	6.8	.1	-9.7
		SOLAR (KJ/M**2/DAY)	5274	8791	14442	16325	19883	22479	21265	17790	13479	8581	4646	3977
44 MEDICINE HAT	ALT	D-D (BASED ON 18 C)	934	739	659	361	189	79	17	34	157	324	588	793
(LATITUDE=50.02)		MEAN AMB TEMP. (C)	-12.1	-8.1	-3.2	5.9	12.1	16.1	20.2	18.9	13.2	7.6	-1.6	-7.6
		SOLAR (KJ/M**2/DAY)	5023	8539	14149	17790	21265	23190	25158	20930	15488	9879	5358	3893
45 MONCTON	NB	D-D (BASED ON 18 C)	806	722	647	447	261	109	26	44	145	308	472	722
(LATITUDE=46.10)		MEAN AMB TEMP. (C)	-8.1	-7.7	-2.8	3.6	9.8	14.9	18.6	17.5	13.2	7.8	2.3	-5.3
		SOLAR (KJ/M**2/DAY)	4479	7786	12223	15572	18460	19256	19925	17121	13018	9042	4437	3809
46 MONT JOLI	QUE	D-D (BASED ON 18 C)	900	798	713	487	305	129	57	77	191	363	538	795
(LATITUDE=48.60)		MEAN AMB TEMP (C)	-11.1	-10.2	-4.9	1.8	8.2	14.1	17.2	16.1	11.8	6.3	.1	-7.6
		SOLAR (KJ/M**2/DAY)	4730	8456	13604	16828	18670	20428	19674	16618	12432	7535	4186	3684
47 MONTREAL INT'L	QUE	D-D (BASED ON 18 C)	865	757	636	369	168	38	7	20	106	269	471	765
(LATITUDE=45.50)		MEAN AMB TEMP. (C)	-9.9	-8.8	-2.3	5.9	12.8	18.5	21.2	19.9	15.3	9.4	2.3	-6.6
		SOLAR (KJ/M**2/DAY)	5337	8540	12435	16082	18818	20103	20952	17130	13170	8244	4474	3815
48 MOOSONEE	ONT	D-D (BASED ON 18 C)	1183	1020	928	608	392	200	106	130	244	414	674	1032
(LATITUDE=51.27)		MEAN AMB TEMP. (C)	-20.2	-18.1	-11.9	-2.3	5.4	11.8	15.5	14.4	10.0	4.7	-4.3	-15.3
		SOLAR (KJ/M**2/DAY)	4261	8182	12734	16637	18194	20207	18438	15195	10855	6165	3372	3114
49 MOUNT FOREST	ONT	D-D (BASED ON 18 C)	828	755	654	406	245	91	41	61	140	299	490	745
(LATITUDE=43.97)		MEAN AMB TEMP. (C)	-8.7	-8.7	-3.1	4.5	10.2	15.9	18.0	17.2	13.8	8.2	1.7	-6.0
		SOLAR (KJ/M**2/DAY)	5274	8288	12474	15907	20302	23023	22604	18837	14651	9544	5023	4060
50 MUSKOKA	ONT	D-D (BASED ON 18 C)	869	763	674	401	230	80	33	51	150	306	505	775
(LATITUDE=44.97)		MEAN AMB TEMP. (C)	-10.0	-9.0	-3.7	4.7	10.7	16.2	18.5	17.6	13.5	8.1	1.2	-6.9
		SOLAR (KJ/M**2/DAY)	5274	8372	12767	16116	21139	23023	22604	18711	14149	9418	4814	3726
51 NATASHQUAN	QUE	D-D (BASED ON 18 C)	927	823	746	560	414	239	125	145	259	419	563	832
(LATITUDE=50.20)		MEAN AMB TEMP (C)	-11.8	-10.9	-6.2	-.6	4.7	10.1	14.1	13.3	9.4	4.5	-.8	-8.8
		SOLAR (KJ/M**2/DAY)	3684	7325	11721	15572	17790	19046	18628	15907	11637	7158	3684	2888
52 NORTH BAY	ONT	D-D (BASED ON 18 C)	956	823	725	444	248	87	37	62	176	343	564	853
(LATITUDE=46.32)		MEAN AMB TEMP. (C)	-12.8	-11.1	-5.4	3.2	10.1	15.8	18.3	17.1	12.4	6.9	-.8	-9.4
		SOLAR (KJ/M**2/DAY)	5442	9209	13814	16577	20428	23232	21976	18628	13311	8707	4521	3809
53 OTTAWA INT'L	ONT	D-D (BASED ON 18 C)	899	778	654	371	181	44	10	28	123	290	499	796
(LATITUDE=45.32)		MEAN AMB TEMP. (C)	-10.9	-9.5	-3.1	5.6	12.4	18.2	20.7	19.3	14.6	8.7	1.4	-7.7
		SOLAR (KJ/M**2/DAY)	5789	9291	13655	16910	19902	21383	21283	18177	13250	8753	4693	4350
54 PEACE RIVER	ALT	D-D (BASED ON 18 C)	1163	881	803	468	267	130	71	111	263	447	800	1020
(LATITUDE=56.25)		MEAN AMB TEMP. (C)	-20.9	-13.8	-8.6	1.8	9.4	13.6	15.9	14.4	9.4	3.6	-8.6	-15.2
		SOLAR (KJ/M**2/DAY)	2721	6279	11805	17581	19883	19883	21976	17790	11637	6698	3307	2009
55 PENTICTON	BC	D-D (BASED ON 18 C)	649	499	445	278	147	52	13	19	107	287	448	570
(LATITUDE=49.47)		MEAN AMB TEMP. (C)	-2.9	.3	3.7	8.7	13.4	17.1	20.1	19.2	14.7	8.7	3.1	-.4
		SOLAR (KJ/M**2/DAY)	3433	7325	11511	16953	21139	23065	24069	20093	14567	8121	4186	2846

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				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
28 FORT ST. JOHN	BC	D-D (BASED ON 18 C)		1093	846	758	465	254	136	77	112	242	430	736	970
(LATITUDE=56.25)		MEAN AMB TEMP. (C)		-17.2	-11.9	-6.4	2.5	9.8	13.6	15.9	14.7	9.9	4.2	-6.5	-13.3
		SOLAR (KJ/M**2/DAY)		2553	5819	11511	16493	19800	22604	21349	17246	11051	6279	3139	1800
29 FREDERICTON	NB	D-D (BASED ON 18 C)		833	737	635	418	235	80	21	39	147	315	489	750
(LATITUDE=45.87)		MEAN AMB TEMP. (C)		-8.8	-8.1	-2.4	4.2	10.6	16.1	19.2	18.1	13.4	7.8	1.7	-6.2
		SOLAR (KJ/M**2/DAY)		5476	8765	12484	15483	17890	20051	19654	17389	12973	8611	4988	4067
30 FROBISHER BAY	NWT	D-D (BASED ON 18 C)		1369	1236	1254	962	660	436	312	342	467	706	912	1191
(LATITUDE=63.75)		MEAN AMB TEMP. (C)		-26.2	-25.2	-22.3	-14.0	-3.3	3.5	7.9	6.9	2.4	-4.7	-12.4	-20.3
		SOLAR (KJ/M**2/DAY)		844	3454	9218	17640	22201	19885	16037	13121	7479	3349	1059	396
31 GANDER INT'L	NFL	D-D (BASED ON 18 C)		747	687	669	516	362	202	73	84	189	362	483	665
(LATITUDE=48.95)		MEAN AMB TEMP. (C)		-6.1	-6.3	-3.6	.8	6.3	11.4	16.5	15.8	11.8	6.3	1.9	-3.4
		SOLAR (KJ/M**2/DAY)		3726	6698	10884	14232	17163	18418	18209	15697	11930	7367	3809	2553
32 GOOSE BAY	NFL	D-D (BASED ON 18 C)		1065	914	821	594	407	214	91	118	248	458	650	942
(LATITUDE=53.32)		MEAN AMB TEMP. (C)		-16.3	-14.4	-8.4	-1.8	4.9	11.1	15.8	14.5	9.8	3.2	-3.6	-12.3
		SOLAR (KJ/M**2/DAY)		3545	7008	11434	15922	18124	18742	17784	14604	10173	6032	3181	2578
33 GRANDE PRAIRIE	ALT	D-D (BASED ON 18 C)		1095	861	790	469	249	133	75	107	236	431	731	968
(LATITUDE=55.17)		MEAN AMB TEMP. (C)		-17.3	-12.4	-7.4	2.4	10.0	13.7	16.0	14.8	10.2	4.2	-6.3	-13.2
		SOLAR (KJ/M**2/DAY)		3684	6363	10465	16409	20428	26749	24679	21097	12809	6823	3391	2135
34 HALIFAX	NS	D-D (BASED ON 18 C)		719	659	608	431	267	119	28	37	141	280	423	643
(LATITUDE=44.65)		MEAN AMB TEMP. (C)		-3.2	-3.3	.1	4.8	9.7	14.4	18.3	18.6	15.6	10.7	5.7	-.6
		SOLAR (KJ/M**2/DAY)		5176	7886	12313	14728	17274	19728	19222	17957	13743	9216	5250	3764
35 INUVIK	NWT	D-D (BASED ON 18 C)		1506	1337	1320	966	584	244	147	231	458	801	1189	1391
(LATITUDE=68.30)		MEAN AMB TEMP. (C)		-29.3	-29.4	-23.8	-14.6	-.8	9.8	13.3	10.3	2.7	-7.2	-20.6	-27.1
		SOLAR (KJ/M**2/DAY)		208	1951	7463	15557	20345	21962	18764	12183	6363	2392	420	28
36 JASPER	ALT	D-D (BASED ON 18 C)		936	694	643	440	288	166	96	126	242	411	654	836
(LATITUDE=52.88)		MEAN AMB TEMP (C)		-12.2	-6.6	-2.7	3.3	8.7	12.5	15.2	14.1	9.9	4.8	-3.8	-9.1
		SOLAR (KJ/M**2/DAY)		3349	6949	11721	17163	20930	23232	22856	18921	15279	7451	3935	2553
37 KAMLOOPS	BC	D-D (BASED ON 18 C)		742	543	458	272	128	41	11	20	106	298	495	642
(LATITUDE=50.68)		MEAN AMB TEMP. (C)		-6.0	-1.3	3.6	9.3	14.3	18.0	20.9	19.7	15.0	8.4	1.7	-2.6
		SOLAR (KJ/M**2/DAY)		3349	6405	11511	16744	20553	23232	23316	19423	13688	7493	3977	2637
38 KAPUSKASING	ONT	D-D (BASED ON 18 C)		1123	956	841	521	319	136	70	105	232	401	667	995
(LATITUDE=49.42)		MEAN AMB TEMP (C)		-18.2	-15.8	-9.1	.6	7.8	14.1	16.9	15.3	10.4	5.1	-4.2	-14.1
		SOLAR (KJ/M**2/DAY)		4646	7828	13228	16409	18209	21767	20344	16702	11763	6865	3642	3433
39 KENORA	ONT	D-D (BASED ON 18 C)		1109	924	776	466	259	91	27	47	196	373	678	986
(LATITUDE=49.80)		MEAN AMB TEMP. (C)		-17.7	-14.7	-7.0	2.5	9.8	15.7	19.1	17.8	11.7	6.0	-4.6	-13.8
		SOLAR (KJ/M**2/DAY)		5274	9209	14442	18000	19883	22604	22939	19172	12642	8205	5023	3767
40 KINGSTON	ONT	D-D (BASED ON 18 C)		784	699	598	367	202	49	6	17	100	243	427	685
(LATITUDE=44.25)		MEAN AMB TEMP. (C)		-7.1	-7.7	-2.1	5.3	12.1	17.2	20.6	19.8	16.3	9.8	3.8	-3.2
		SOLAR (KJ/M**2/DAY)		5442	8372	12893	15907	20302	21767	21767	19046	14651	9418	5023	4186
41 LETHBRIDGE	ALT	D-D (BASED ON 18 C)		851	666	634	383	221	106	29	48	168	323	560	729
(LATITUDE=49.70)		MEAN AMB TEMP. (C)		-9.4	-5.6	-2.4	5.3	10.9	14.9	18.8	17.6	12.7	7.6	-.7	-5.5
		SOLAR (KJ/M**2/DAY)		4772	8372	13688	17832	21516	23986	25493	21432	15404	10046	5651	3516

				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
42	LONDON	ONT	D-D (BASED ON 18 C)	746	668	582	342	183	48	12	22	98	251	446	670
	(LATITUDE=42.98)		MEAN AMB TEMP. (C)	-6.0	-5.6	-.7	6.6	12.3	18.2	20.5	19.7	15.7	9.9	3.1	-3.6
			SOLAR (KJ/M**2/DAY)	5274	8372	12558	15907	20511	22814	22604	19795	14860	10256	5274	4605
43	MANIWAKI	QUE	D-D (BASED ON 18 C)	975	841	722	426	240	87	40	67	176	346	539	860
	(LATITUDE=46.38)		MEAN AMB TEMP. (C)	-13.4	-11.8	-5.3	3.8	10.4	15.8	18.1	16.8	12.4	6.8	1	-9.7
			SOLAR (KJ/M**2/DAY)	5274	8791	14442	16325	19883	22479	21265	17790	13479	8581	4646	3977
44	MEDICINE HAT	ALT	D-D (BASED ON 18 C)	934	739	659	361	189	79	17	34	157	324	588	793
	(LATITUDE=50.02)		MEAN AMB TEMP. (C)	-12.1	-8.1	-3.2	5.9	12.1	16.1	20.2	18.9	13.2	7.6	-1.6	-7.6
			SOLAR (KJ/M**2/DAY)	5023	8539	14149	17790	21265	23190	25158	20930	15488	9879	5358	3893
45	MONCTON	NB	D-D (BASED ON 18 C)	806	722	647	447	261	109	26	44	145	308	472	722
	(LATITUDE=46.10)		MEAN AMB TEMP. (C)	-8.1	-7.7	-2.8	3.6	9.8	14.9	18.6	17.5	13.2	7.8	2.3	-5.3
			SOLAR (KJ/M**2/DAY)	4479	7786	12223	15572	18460	19256	19925	17121	13018	9042	4437	3809
46	MONT JOLI	QUE	D-D (BASED ON 18 C)	900	798	713	487	305	129	57	77	191	363	538	795
	(LATITUDE=48.60)		MEAN AMB TEMP. (C)	-11.1	-10.2	-4.9	1.8	8.2	14.1	17.2	16.1	11.8	6.3	.1	-7.6
			SOLAR (KJ/M**2/DAY)	4730	8456	13604	16828	18670	20428	19674	16618	12432	7535	4186	3684
47	MONTREAL INT'L	QUE	D-D (BASED ON 18 C)	865	757	636	369	168	38	7	20	106	269	471	765
	(LATITUDE=45.50)		MEAN AMB TEMP. (C)	-9.9	-8.8	-2.3	5.9	12.8	18.5	21.2	19.9	15.3	9.4	2.3	-6.6
			SOLAR (KJ/M**2/DAY)	5337	8540	12435	16082	18818	20103	20952	17130	13170	8244	4474	3815
48	MOOSONEE	ONT	D-D (BASED ON 18 C)	1183	1020	928	608	392	200	106	130	244	414	674	1032
	(LATITUDE=51.27)		MEAN AMB TEMP. (C)	-20.2	-18.1	-11.9	-2.3	5.4	11.8	15.5	14.4	10.0	4.7	-4.3	-15.3
			SOLAR (KJ/M**2/DAY)	4261	8182	12734	16637	18194	20207	18438	15195	10855	6165	3372	3114
49	MOUNT FOREST	ONT	D-D (BASED ON 18 C)	828	755	654	406	245	91	41	61	140	299	490	745
	(LATITUDE=43.97)		MEAN AMB TEMP. (C)	-8.7	-8.7	-3.1	4.5	10.2	15.9	18.0	17.2	13.8	8.2	1.7	-6.0
			SOLAR (KJ/M**2/DAY)	5274	8288	12474	15907	20302	23023	22604	18837	14651	9544	5023	4060
50	MUSKOKA	ONT	D-D (BASED ON 18 C)	869	763	674	401	230	80	33	51	150	306	505	775
	(LATITUDE=44.97)		MEAN AMB TEMP. (C)	-10.0	-9.0	-3.7	4.7	10.7	16.2	18.5	17.6	13.5	8.1	1.2	-6.9
			SOLAR (KJ/M**2/DAY)	5274	8372	12767	16116	21139	23023	22604	18711	14149	9418	4814	3726
51	NATASHQUAN	QUE	D-D (BASED ON 18 C)	927	823	746	560	414	239	125	145	259	419	563	832
	(LATITUDE=50.20)		MEAN AMB TEMP. (C)	-11.8	-10.9	-6.2	-.6	4.7	10.1	14.1	13.3	9.4	4.5	-.8	-8.8
			SOLAR (KJ/M**2/DAY)	3684	7325	11721	15572	17790	19046	18628	15907	11637	7158	3684	2888
52	NORTH BAY	ONT	D-D (BASED ON 18 C)	956	823	725	444	248	87	37	62	176	343	564	853
	(LATITUDE=46.32)		MEAN AMB TEMP. (C)	-12.8	-11.1	-5.4	3.2	10.1	15.8	18.3	17.1	12.4	6.9	-.8	-9.4
			SOLAR (KJ/M**2/DAY)	5442	9209	13814	16577	20428	23232	21976	18628	13311	8707	4521	3809
53	OTTAWA INT'L	ONT	D-D (BASED ON 18 C)	899	778	654	371	181	44	10	28	123	290	499	796
	(LATITUDE=45.32)		MEAN AMB TEMP. (C)	-10.9	-9.5	-3.1	5.6	12.4	18.2	20.7	19.3	14.6	8.7	1.4	-7.7
			SOLAR (KJ/M**2/DAY)	5789	9291	13655	16910	19902	21383	21283	18177	13250	8753	4693	4350
54	PEACE RIVER	ALT	D-D (BASED ON 18 C)	11[illegible]3	881	803	468	267	130	71	111	263	447	800	1020
	(LATITUDE=56.25)		MEAN AMB TEMP. (C)	-20.9	-13.8	-8.6	1.8	9.4	13.6	15.9	14.4	9.4	3.6	-8.6	-15.2
			SOLAR (KJ/M**2/DAY)	2721	6279	11805	17581	19883	19883	21976	17790	11637	6698	3307	2009
55	PENTICTON	BC	D-D (BASED ON 18 C)	649	499	445	278	147	52	13	19	107	287	448	570
	(LATITUDE=49.47)		MEAN AMB TEMP. (C)	-2.9	.3	3.7	8.7	13.4	17.1	20.1	19.2	14.7	8.7	3.[illegible]	-.4
			SOLAR (KJ/M**2/DAY)	3433	7325	11511	16953	21139	23065	24069	20093	14567	8121	4186	2846

********** CANADIAN CITY DATA USED FCHART **********

			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
56 PORT HARDY	BC	D-D (BASED ON 18 C)	484	401	421	345	262	178	136	131	183	289	380	451
(LATITUDE=50.67)		MEAN AMB TEMP (C)	2.4	3.8	4.4	6.5	9.6	12.1	13.6	13.8	11.9	8.7	5.3	3.4
		SOLAR (KJ/M**2/DAY)	2733	5546	8786	13019	17951	18370	18973	15370	11127	5983	3064	2080
57 POSTE DE LA BA	QUE	D-D (BASED ON 18 C)	1256	1144	1066	745	535	365	235	243	315	483	684	1024
(LATITUDE=55.28)		MEAN AMB TEMP. (C)	-22.3	-22.2	-16.5	-6.8	.9	6.3	10.6	10.3	7.5	2.3	-4.7	-14.8
		SOLAR (KJ/M**2/DAY)	3139	6907	12139	16660	18418	19925	17874	14149	9335	5358	2595	2177
58 PRINCE ALBERT	SAS	D-D (BASED ON 18 C)	1204	987	883	489	265	119	45	74	234	436	753	1073
(LATITUDE=53.17)		MEAN AMB TEMP. (C)	-21.1	-16.9	-10.4	1.7	9.5	14.3	17.7	16.2	10.2	3.9	-7.1	-16.4
		SOLAR (KJ/M**2/DAY)	3977	7786	13604	18628	20511	22186	22939	18628	12558	7702	3977	2805
59 PRINCE GEORGE	BC	D-D (BASED ON 18 C)	925	685	623	422	265	152	102	135	245	413	626	795
(LATITUDE=53.83)		MEAN AMB TEMP. (C)	-11.8	-6.2	-2.1	3.9	9.4	13.0	14.9	13.7	9.8	4.7	-2.8	-7.6
		SOLAR (KJ/M**2/DAY)	2626	5301	9854	16199	18213	21238	19304	16604	11465	5906	3058	1778
60 PRINCE RUPERT	BC	D-D (BASED ON 18 C)	655	439	477	407	305	193	156	162	211	328	459	592
(LATITUDE=54.28)		MEAN AMB TEMP. (C)	.1	2.6	3.2	5.3	8.5	11.1	12.8	13.4	11.6	8.2	4.2	1.1
		SOLAR (KJ/M**2/DAY)	2512	4730	10088	13604	18418	18628	16702	14232	8581	4688	2512	1340
61 QUEBEC	QUE	D-D (BASED ON 18 C)	919	810	692	441	232	76	22	45	155	332	533	823
(LATITUDE=46.81)		MEAN AMB TEMP. (C)	-11.6	-10.6	-4.4	3.3	10.6	16.3	19.2	17.8	13.1	7.2	2	-8.6
		SOLAR (KJ/M**2/DAY)	5442	9209	14442	16660	19256	21349	20511	17372	13186	8372	4605	4395
62 RED DEER	ALT	D-D (BASED ON 18 C)	1021	817	751	443	260	143	69	106	238	416	679	902
(LATITUDE=52.27)		MEAN AMB TEMP (C)	-14.9	-10.9	-6.2	3.2	9.6	13.4	16.2	14.8	10.1	4.6	-4.6	-11.1
		SOLAR (KJ/M**2/DAY)	3977	7744	13479	17790	21181	22939	21976	17497	13856	8707	5191	3139
63 REGINA	SAS	D-D (BASED ON 18 C)	1094	914	817	441	234	97	29	46	198	394	697	959
(LATITUDE=50.45)		MEAN AMB TEMP (C)	-17.3	-14.3	-8.3	3.3	10.6	15.3	18.9	17.9	11.6	5.3	-5.2	-12.9
		SOLAR (KJ/M**2/DAY)	5149	8791	14442	18418	21139	23065	24488	20093	14232	9209	5065	3767
64 RESOLUTE	NWT	D-D (BASED ON 18 C)	1567	1456	1527	1232	889	549	425	474	687	1016	1275	1452
(LATITUDE=74.68)		MEAN AMB TEMP (C)	-32.6	-33.5	-31.3	-23.1	-10.7	-.3	4.3	2.7	-4.9	-14.7	-24.2	-28.8
		SOLAR (KJ/M**2/DAY)	0	635	5261	14741	23221	25039	18589	11147	5216	1270	73	0
65 REVELSTOKE	BC	D-D (BASED ON 18 C)	742	561	500	323	163	68	21	36	130	344	516	669
(LATITUDE=51.00)		MEAN AMB TEMP. (C)	-7.4	-3.0	6	6.3	12.6	15.8	18.6	17.3	12.9	6.8	1.1	-3.7
		SOLAR (KJ/M**2/DAY)	3767	7032	11846	17163	21139	23358	23902	19883	14149	7953	4395	3558
66 RIVIERE AU REN	QUE	D-D (BASED ON 18 C)	849	788	717	523	351	160	77	92	201	371	520	738
(LATITUDE=49.02)		MEAN AMB TEMP. (C)	-9.6	-9.7	-5.4	-.1	6.3	12.2	16.4	15.7	11.5	6.4	.7	-6.3
		SOLAR (KJ/M**2/DAY)	3935	5358	10381	15697	17832	18414	18837	15697	11637	7325	3809	3014
67 RIVIER DU LOUP	QUE	D-D (BASED ON 18 C)	936	826	726	491	294	120	51	84	196	374	555	831
(LATITUDE=47.80)		MEAN AMB TEMP. (C)	-12.3	-11.6	-5.6	1.2	8.4	14.0	17.2	15.7	11.5	5.9	-.7	-8.8
		SOLAR (KJ/M**2/DAY)	5023	8623	13939	16786	18837	20804	19800	16744	12558	7870	4479	3935
68 SAINT JOHN	NB	D-D (BASED ON 18 C)	790	721	640	447	286	135	49	62	162	313	464	702
(LATITUDE=45.27)		MEAN AMB TEMP. (C)	-7.1	-6.6	-1.4	4.1	9.6	13.7	17.1	17.2	14.0	8.9	3.1	-4.3
		SOLAR (KJ/M**2/DAY)	5274	8581	12893	15697	18628	20721	19883	18418	14442	8539	5023	4395
69 SASKATOON	SAS	D-D (BASED ON 18 C)	1139	936	829	445	233	97	30	54	204	402	714	994
(LATITUDE=52.23)		MEAN AMB TEMP. (C)	-18.7	-15.1	-8.7	3.3	10.6	15.4	18.8	17.4	11.3	5.0	-5.8	-14.0
		SOLAR (KJ/M**2/DAY)	4186	8121	13479	17121	20846	22353	23525	18963	13521	8288	4312	3056

			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
70 SCHEFFERVILLE	QUE	D-D (BASED ON 18 C)	1261	1106	1016	750	529	287	172	227	372	588	803	1118
(LATITUDE=54.80)		MEAN AMB TEMP. (C)	-22.7	-21.2	-14.8	-6.9	9	8.3	12.6	10.8	5.6	-.9	-8.7	-18.1
		SOLAR (KJ/M**2/DAY)	3139	7032	12935	17163	17790	18921	16618	14525	9544	5609	3098	2302
71 SEPT-ILLES	QUE	D-D (BASED ON 18 C)	989	867	767	549	382	194	95	122	252	436	607	875
(LATITUDE=50.22)		MEAN AMB TEMP. (C)	-13.9	-12.7	-6.7	-.3	5.7	11.6	15.1	14.2	9.6	4.0	-2.2	-10.4
		SOLAR (KJ/M**2/DAY)	4569	8177	12174	15061	18254	21500	18500	16677	11348	7453	4081	3097
72 SHERBROOKE	QUE	D-D (BASED ON 18 C)	917	811	694	434	246	100	47	75	179	343	528	814
(LATITUDE=45.40)		MEAN AMB TEMP. (C)	-11.6	-10.7	-4.3	3.6	10.3	15.3	17.8	16.5	12.4	7.0	.6	-8.4
		SOLAR (KJ/M**2/DAY)	4814	8581	13395	15697	19256	21767	21139	17790	14232	8791	4939	4395
73 SIMCO	ONT	D-D (BASED ON 18 C)	718	644	563	331	185	49	10	20	93	243	430	644
(LATITUDE=42.85)		MEAN AMB TEMP. (C)	-6.2	-6.1	-.3	6.7	12.3	18.1	20.3	19.4	15.8	9.9	3.9	-3.1
		SOLAR (KJ/M**2/DAY)	5358	8372	12558	15697	20093	23023	21976	19046	15488	10046	5316	4228
74 ST. JOHN'S	NFL	D-D (BASED ON 18 C)	674	629	634	507	387	229	98	91	184	337	435	599
(LATITUDE=47.57)		MEAN AMB TEMP. (C)	-3.8	-4.2	-2.4	1.1	5.5	10.4	15.3	15.4	11.9	7.1	3.5	-1.3
		SOLAR (KJ/M**2/DAY)	4204	7096	10485	13427	16529	19332	20209	15785	12045	6865	4046	2984
75 STEPHENVILLE	NFL	D-D (BASED ON 18 C)	707	674	646	490	346	197	75	67	172	328	447	634
(LATITUDE=48.53)		MEAN AMB TEMP. (C)	-4.8	-5.8	-2.8	1.7	6.8	11.5	15.9	16.2	12.3	7.4	3.1	-2.2
		SOLAR (KJ/M**2/DAY)	3851	7242	11511	13604	17581	19046	18628	16032	12139	7577	3767	2930
76 SUDBURY	ONT	D-D (BASED ON 18 C)	982	860	752	452	255	87	33	59	176	348	572	871
(LATITUDE=46.48)		MEAN AMB TEMP. (C)	-13.4	-12.1	-6.0	3.1	10.1	16.3	18.9	17.5	12.7	7.1	-.9	-9.8
		SOLAR (KJ/M**2/DAY)	5400	8707	14232	16744	20511	23358	22521	18837	13060	8414	4395	3767
77 SWIFT CURRENT	SAS	D-D (BASED ON 18 C)	991	809	742	429	242	110	33	54	194	370	648	860
(LATITUDE=50.33)		MEAN AMB TEMP. (C)	-13.9	-10.6	-5.9	3.7	10.3	14.8	18.7	17.7	11.8	6.1	-3.7	-9.7
		SOLAR (KJ/M**2/DAY)	5072	8765	14329	18115	21514	22935	24438	20206	14364	9441	5279	3832
78 SYDNEY	NS	D-D (BASED ON 18 C)	696	664	633	475	320	158	41	41	130	283	413	605
(LATITUDE=46.17)		MEAN AMB TEMP. (C)	-4.4	-5.5	-2.4	2.2	7.7	13.0	17.9	17.8	13.9	8.9	4.2	-1.5
		SOLAR (KJ/M**2/DAY)	4186	7577	11721	14232	18628	20093	19883	16953	13395	8163	4144	3349
79 TERRACE	BC	D-D (BASED ON 18 C)	734	536	504	369	244	130	77	90	184	365	534	663
(LATITUDE=54.52)		MEAN AMB TEMP. (C)	-5.7	-.9	1.8	5.7	10.2	14.0	16.2	15.6	11.9	6.3	.2	-3.4
		SOLAR (KJ/M**2/DAY)	2470	5191	10256	14442	18418	19256	17749	14609	9418	4939	2512	1591
80 THE PAS	MAN	D-D (BASED ON 18 C)	1253	1026	913	554	322	130	40	74	237	439	766	1098
(LATITUDE=53.82)		MEAN AMB TEMP. (C)	-22.4	-18.3	-11.4	-.4	7.7	14.0	17.9	16.3	10.2	3.8	-7.5	-17.4
		SOLAR (KJ/M**2/DAY)	3303	6892	12669	18392	20345	20516	20705	16714	11292	6513	3224	2459
81 THOMPSON	MAN	D-D (BASED ON 18 C)	1381	1136	993	619	388	178	97	137	329	573	874	1225
(LATITUDE=55.80)		MEAN AMB TEMP. (C)	-26.2	-21.5	-13.6	-2.7	5.7	12.3	15.3	14.0	6.6	-.3	-11.2	-21.5
		SOLAR (KJ/M**2/DAY)	3474	7325	13186	19088	21893	22395	21976	15697	10465	6070	3265	2177
82 THUNDER BAY	ONT	D-D (BASED ON 18 C)	1017	877	749	469	301	131	47	71	204	371	616	893
(LATITUDE=48.37)		MEAN AMB TEMP. (C)	-14.8	-13.0	-6.2	2.4	8.3	13.8	17.5	16.5	11.3	6.1	-2.5	-10.8
		SOLAR (KJ/M**2/DAY)	5358	9209	14442	18000	19883	22604	23232	18711	12893	8163	5065	3851
83 TIMMINS	ONT	D-D (BASED ON 18 C)	1090	944	824	502	299	124	63	98	225	396	647	977
(LATITUDE=48.47)		MEAN AMB TEMP. (C)	-16.9	-14.8	-8.6	1.3	8.7	14.7	17.4	15.7	10.9	5.4	-3.5	-13.1
		SOLAR (KJ/M**2/DAY)	5232	8581	14442	17246	19465	22270	21349	17581	12014	7325	3935	3474

********** CANADIAN CITY DATA USED FCHART **********

				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
84 TORONTO INT'L	ONT	D-D (BASED ON 18 C)		755	671	587	348	187	48	10	19	98	254	438	667
(LATITUDE=43.68)		MEAN AMB TEMP. (C)		-6.3	-5.8	-.9	6.4	12.2	18.2	20.7	20.0	15.7	9.8	3.4	-3.5
		SOLAR (KJ/M**2/DAY)		5216	8067	12044	16109	19801	21851	21894	18754	13930	9347	4748	3864
85 TRENTON	ONT	D-D (BASED ON 18 C)		784	683	585	345	177	42	7	17	97	255	437	687
(LATITUDE=44.10)		MEAN AMB TEMP. (C)		-7.2	-6.2	-.8	6.6	12.4	18.2	20.8	20.1	15.7	9.8	3.4	-4.3
		SOLAR (KJ/M**2/DAY)		5358	8372	12600	15697	16116	23023	21976	19046	14693	9418	5149	4270
86 TRURO	NS	D-D (BASED ON 18 C)		764	697	636	446	287	139	38	58	161	313	443	678
(LATITUDE=45.43)		MEAN AMB TEMP. (C)		-5.9	-6.3	-2.3	3.2	8.7	13.3	17.6	16.7	12.6	7.8	3.3	-3.3
		SOLAR (KJ/M**2/DAY)		4646	8163	12349	15111	18795	20930	20721	17874	14149	8623	4730	3935
87 VAL D'OR	QUE	D-D (BASED ON 18 C)		1079	931	827	506	304	121	66	97	219	399	633	964
(LATITUDE=48.05)		MEAN AMB TEMP. (C)		-16.7	-14.4	-8.3	1.3	8.4	14.6	17.1	15.4	10.8	4.9	-2.9	-12.7
		SOLAR (KJ/M**2/DAY)		5274	8539	14860	17037	19297	21976	20511	17246	12223	7619	4144	3642
88 VANCOUVER INT'	BC	D-D (BASED ON 18 C)		484	383	377	272	174	85	35	40	114	245	358	440
(LATITUDE=49.28)		MEAN AMB TEMP. (C)		2.4	4.4	5.8	8.9	12.4	15.3	17.4	17.1	14.2	10.1	6.1	3.8
		SOLAR (KJ/M**2/DAY)		2881	5614	9956	15110	20321	21814	22942	18707	13452	7243	3576	2279
89 VICTORIA INT'L	BC	D-D (BASED ON 18 C)		467	375	378	282	191	108	61	65	122	247	353	427
(LATITUDE=48.65)		MEAN AMB TEMP. (C)		2.9	4.7	5.8	8.6	11.9	14.5	16.4	16.1	13.9	10.0	6.2	4.2
		SOLAR (KJ/M**2/DAY)		3139	6279	10507	16744	21014	23023	23023	19046	14651	7325	4228	2595
90 WHITEHORSE	YUK	D-D (BASED ON 18 C)		1143	881	798	543	338	171	125	176	307	537	812	1048
(LATITUDE=60.75)		MEAN AMB TEMP. (C)		-18.9	-13.2	-7.7	-.1	7.1	12.4	14.1	12.3	7.8	7	-9.0	-15.8
		SOLAR (KJ/M**2/DAY)		1301	4005	9369	15405	19882	21269	19055	14729	9021	4283	1662	737
91 WIARTON	ONT	D-D (BASED ON 18 C)		765	702	654	392	243	89	29	35	122	264	451	666
(LATITUDE=44.75)		MEAN AMB TEMP. (C)		-6.6	-6.8	-3.0	4.9	10.3	15.8	18.7	18.4	14.6	9.6	2.9	-3.4
		SOLAR (KJ/M**2/DAY)		5149	8288	12474	16325	21139	23232	22814	19046	14232	9209	4730	3767
92 WILLIAMS LAKE	BC	D-D (BASED ON 18 C)		873	645	601	410	257	146	86	106	224	408	607	772
(LATITUDE=52.13)		MEAN AMB TEMP. (C)		-10.2	-4.9	-4.1	4.3	9.6	13.3	15.7	14.9	10.8	5.1	-2.2	-6.8
		SOLAR (KJ/M**2/DAY)		3433	6321	11428	15949	19883	22437	21976	18293	12558	6698	3558	2344
93 WINDSOR	ONT	D-D (BASED ON 18 C)		691	606	520	295	141	29	3	8	64	204	411	618
(LATITUDE=42.33)		MEAN AMB TEMP. (C)		-4.3	-3.4	1.2	8.2	14.0	19.9	22.3	21.3	17.4	11.6	4.3	-2.0
		SOLAR (KJ/M**2/DAY)		5191	8163	12349	15907	20302	22814	22604	19256	15697	10674	5358	4605
94 WINNIPEG INT'L	MAN	D-D (BASED ON 18 C)		1126	953	810	441	236	76	21	38	175	356	674	983
(LATITUDE=49.90)		MEAN AMB TEMP. (C)		-18.3	-15.7	-8.1	3.3	10.6	16.5	19.7	18.7	12.6	6.6	-4.4	-13.7
		SOLAR (KJ/M**2/DAY)		5234	9070	14076	17574	20964	22696	22985	19145	13392	8238	4605	3817
95 YARMOUTH	NS	D-D (BASED ON 18 C)		641	592	551	401	270	141	55	55	126	252	376	564
(LATITUDE=43.83)		MEAN AMB TEMP. (C)		-2.7	-2.9	.2	4.6	9.3	13.3	16.4	16.4	13.9	9.8	5.4	-.2
		SOLAR (KJ/M**2/DAY)		5358	8791	12977	15279	18628	20721	20721	18670	14986	8874	5400	4605
96 YELLOWKNIFE	NWT	D-D (BASED ON 18 C)		1445	1235	1138	777	435	178	76	126	333	596	967	1287
(LATITUDE=62.47)		MEAN AMB TEMP. (C)		-28.6	-25.7	-18.6	-7.8	4.0	12.2	16.0	14.1	6.8	-1.2	-14.2	-23.8
		SOLAR (KJ/M**2/DAY)		1005	3935	9963	18209	23860	23232	20428	15697	8372	4060	1256	753
97 YORKTON	SAS	D-D (BASED ON 18 C)		1163	952	853	480	256	102	34	58	211	400	722	1008
(LATITUDE=51.18)		MEAN AMB TEMP. (C)		-19.0	-15.7	-9.6	2.1	9.9	15.1	18.5	17.2	11.1	5.1	-6.0	-14.4
		SOLAR (KJ/M**2/DAY)		4772	9209	13814	18418	20511	22604	23525	19465	13395	8581	4521	3391

APPENDIX III

Map of Canadian Cities
Listed in Appendix II